Annexure

A

Consuming Web Services

A.1 | Endpoint Connections

In Chapters 22 and Chapter 23, we built various webservice APIs using Spring and Hibernate. Now, we need to focus on the front end to consume these webservices in order to provide the desired functionality to the users. In Section 24.1, we will focus on the front end to call the webservice APIs.

The following JQuery Ajax code block tries to call Customer web service to fetch customer record by passing email address. This method call is asynchronous in nature which means the processing will take place parallelly and code will not wait for the result to come back from the server. This call uses GET method to pass email parameter to the getCustomerByEmail webservice API. In Chapter 22, we developed a Customer Endpoint "". We will call this using GET method by passing the customer's email address.

```
var EmailAddress = "sales@zonopact.com";
// you can get this data from loggedin user account
$.ajax({
    url: "https://localhost/customer/getCustomerByEmail",
    type: "get", //send it through get method
    data: {
        email: EmailAddress
    },
    success: function(response) {
    //On Success, we will get the customer data in a JSON format
    },
    error: function(xhr) {
    //In case of error, we will get the error object and handle this on the front end so
user knows what is going on in the system
    }
});
```

As you can see from the above example, we are calling the web service endpoint. Please note we are hosting the following web service on our localhost: url: https://localhost/customer/getCustomerByEmail

Hence, using the following URL. You can replace this with any URL where you are hosting the web service.

In the success section, we are going to process the response that is in JSON format. Let us take a quick look at how to process the incoming JSON response that contains customer information for the given email address.

The following code shows how to parse the incoming response to get JSON object and then call object properties to get data out of it. In the following example, we are getting customer's name.

```
var obj = jQuery.parseJSON(response);
alert( obj.name );
This alert will give us customer name. This way you can get other data elements as well.
   Finally, this is how the complete Ajax code will look.
var EmailAddress = "sales@zonopact.com"; // you can get this data from loggedin user
account
$.ajax({
       url: "https://localhost/customer/getCustomerByEmail",
       type: "get", //send it through get method
       data: {
          email: EmailAddress
       },
       success: function(response) {
       //On Success, we will get the customer data in a JSON format

       var obj = jQuery.parseJSON(response);
          alert( obj.name );
       },
       error: function(xhr) {
       //In case of error, we will get the error object and handle this on the front end
so user knows what is going on in the system
       }
});
```

Create a one-page application which uses JQuery ajax to get weather information from OpenWeatherMap website. You will find the required API on the following site: https://openweathermap.org/current

Annexure

B

Possible Interview Questions and Answers

B.1 | HyperText Markup Language (HTML)

1. Is it compulsory to close all of the tags in HTML?

Answer: In HTML5, it is not compulsory to close some specific HTML tags. The tags which do not need to have a closing tag are known as *self-closing tags*.

2. What do you understand by "head" in HTML?

Answer: The "head" in an HTML document is the part that is not shown in the web browser whenever the page is fully loaded. It is the first section of the code that comprises of important information about a web page's links and properties. By exploring an HTML head, you can gather the title of the page, CSS code, meta tags, Open Graph tags along with JavaScript code.

3. How would you use an image map?

Answer: An image map works as a graphical image in which the users can click on different places of the image to be directed to different destinations. Unlike an ordinary image link where the entire image is linked to a single destination. An image map is drafted to hyperlink various areas in the image to various destinations. Image maps are helpful for linking different sections of an image without having the need to create separate image files for an image.

4. Can you create multicolored text on a web page?

Answer: Yes, it is simple to create multicolored text on a webpage. To create text with multiple colors, you need use < font color="color">….< /font> tags in every character that want to put color. This tag combination can be used as many times as needed.

5. How will you keep list elements straight in an HTML file?

Answer: We can keep the elements straight in an HTML file by using indents for it. The indents specify the amount of white space that is allocated before texts.

6. Can old HTML files work in a new web browser?

Answer: Yes, older HTML files will work in new web browsers as they are compliant to HTML standards. The majority of the old files will continue to work on the newer browsers. However, some features may not work.

7. What do you understand by Applet?

Answer: It is a small application that is used for support and enhancement of hosting web application. Applets are usually created using Java programming language and can run in a web browser.

8. Can you set specific colors for table borders?

Answer: The color of the border can be set with the BORDERCOLOR attribute of the <TABLE> tag.

9. If we open a CSS file in a browser, what will be the outcome?

Answer: If we try to open a CSS file in a browser, then the browser will not open the file because the file has a different extension. The only way we can utilize a CSS file is to reference it using <link/> tag within another HTML file.

10. Differentiate between HTML and XHTML?

Answer: HTML and XHTML are mark-up languages in which we write web pages. In comparison, XHTML is more strict in its syntax rules than HTML. HTML is SGML based, whereas XHTML is XML based. We can say they are like two sides of the same coin. XHTML was taken HTML to conform to XML standards. This is the reason why XHTML is strict as compared with HTML. Therefore, we can say that HTML is the dominant mark-up language used for building web pages, whereas XHTML is like a brother of XML languages which is used for extending or mirroring versions of HTML.

11. Is JavaScript supported by HTML?

Answer: Yes, JavaScript is supported by HTML. It very easy to implement JavaScript. You just need to put your code inside the HTML document and inform the web browser that it is JavaScript. JavaScript can work on web users' computer even if they are not connected to the Internet.

12. How can you use JavaScript with HTML?

Answer: It very easy to implement JavaScript. You just need to put your code inside the HTML document and inform the web browser that it is JavaScript. JavaScript can work on web users' computer even if they are not connected to the Internet. It allows you to create very responsive interfaces for a web page that greatly improves the user experience and facilitates powerful dynamic functionality.

13. How can you use an iframe?

Answer: An iframe allows us to load separate HTML documents into an existing document. You can place an iframe anywhere in the document flow. The main advantage of the iframe is that it provides the user with the power to decide the size of the portion in which he/she desires to display the content of another webpage.

14. What do you understand by SPAN in HTML?

Answer: The SPAN tag is an inline container used for line content and elements. It has the job to group elements for styling purpose.

15. What do you understand by logical and physical tags in HTML?

Answer: Logical tags are used to explain the meaning of the enclosed text, whereas physical tags are used to specify exactly how particular characters are to be formatted.

16. What is the difference between HTML and HTML5?

Answer: HTML is an older technology, which was developed in 1990. On the other hand, HTML5 is relatively new as it was developed in 2014. The main difference between the two is that audio and video are an integral part of HTML5, while these two elements were not supported in HTML. Before HTML5, people had to rely on Flash as a tool to embed media into web pages. In HTML5, you don't need to rely on third-party applications for embedding audio and video. Vector graphics also got included in HTML5 as standard. In older HTML, vector graphics can be used with the help of different technologies like Silverlight, Flash, VML, etc. In HTML, developers can utilize the web browser cache for temporary storage, while in HTML5 we need to utilize application cache, web storage, SQL database for storing temporary data. HTML is supported by almost every older web browsers. However, the majority of modern web browsers such as Chrome, Firefox, Opera, Edge, Safari, etc. are supporting HTML5.

17. How and why do we use CSS in HTML?

Answer: We use CSS to style the HTML the way we want. There are two methods to use CSS in HTML. We can do it by embedding it right on an index.html file or linking it by creating a separate CSS file.

18. Why do we use Marquee tag in HTML?

Answer: The Marque tag is used in HTML for scrolling a part of text or image that is displayed vertically or horizontally on a web site page.

19. Mention the new structural elements in HTML5.

Answer: There are a number of HTML elements introduced in HTML5. Body, Main, Article, Section, Aside, Nav are of the structural elements of HTML5.

20. Explain the types of headings used in HTML.

Answer: HTML has six levels of headings. Each heading element shows the font changes, paragraph breaks, and any white space required to render the heading. H1, H2, H3, H4, H5, and H6 are the six different heading levels. H1 has the highest importance, while H6 has the lowest.

B.2 | Cascading Style Sheets (CSS)

1. Name the components of a CSS style.

Answer: There are three main components of CSS style – selector, property, value. Selector is an HTML tag on which the style is meant to be applied. Property is a style that is applied to the element. Value is used for assigning the value to a property.

2. What do you understand by a type selector?

Answer: A CSS selector is a part of the CSS rule set that mainly selects the content we want to style. It selects HTML elements according to their id, class, type, attribute, etc. There are various selectors in CSS. These are some examples: CSS Element selector, CSS Id selector, CSS Class selector, CSS Universal selector, and CSS Group selector.

3. What is a block element in CSS?

Answer: There will be Line Break for Block element and we can adjust the height and width of the element.

4. How do we utilize CSS image sprites?

Answer: CSS image sprites are two-dimensional images which are built of combining small images into one single larger image with defined X and Y coordinates. To execute this, you can use CSS background-position properly by defining the exact placement of the image to be shown.

5. How and when CSS originated.

Answer: On 10 October, 1994, Hakon Wium Lie first proposed the concept of CSS.

6. Mention the limitations of CSS.

Answer: Although CSS is very powerful for designing, it cannot perform any arithmetical and logical task. More limitations:

- CSS cannot interact with databases
- It cannot request a web page
- We cannot read files by using CSS

7. Differentiate between inline, embedded, and external style sheets.

Answer: With inline CSS attribute, you can style attribute of any HTML element to set the style rules. With Embedded CSS you can define your CSS rules into HTML document by using the <style> element. With External CSS, you can include an external style sheet file in your HTML document.

8. Which property would you use to define the width of the outline?

Answer: An outline is a line that is drawn near the elements to make the element show well. We use the outline-width to specify with the width of an outline.

9. Which syntax is used to add multiple background images in CSS3?

Answer: The CSS Multi background property is used to adding multiple images at a time without HTML code. By this, we can add images according to our requirements. An example of the syntax of multibackground images:

```
#multibackground {
background-image: url(/css/images/logo.png), url(/css/images/border.png);
background-position: left top, left top;
background-repeat: no-repeat, repeat;
padding: 75px;
}
```

10. How would you use the transition effect in CSS3?

Answer: We use the transition property in CSS to make some transition effects. This effect is a combination of four properties; transition property, transition duration, transition timing function, transition delay.

B.3 | JQuery

1. Explain where JQuery is used?

Answer: JQuery works as a JavaScript library. It is used for HTML DOM access and it facilitates the most important feature of event handling as well.

2. Differentiate between JavaScript and JQuery.

Answer: JQuery is a library, while JavaScript is a language. JQuery is responsible for providing fully-functional support for JavaScript language.

3. What is the important of "$" sign in JQuery?

Answer: The "$" is used as a designation for JQuery. Example: `$('#MyControl')`

4. How will you hide and show controls in JQuery?

Answer: To hide and show the controls you need to access the control using "$" sign and utilize the methods `Hide()` and `Show()`.

5. What do you understand by selectors in JQuery?

Answer: A JQuery selector is a functionality which utilizes expressions to locate matching elements from a DOM based on certain criteria. They are used to select HTML elements using JQuery.

6. Differentiate between "length" and "size" in JQuery.

Answer: Both "length" and "size" are used for finding the number of elements in an object. We use "length" commonly because it is faster as compared with "size" because "length" stands a property, while "size"s is a method.

7. Why do we use JQuery connect?

Answer: We use JQuery for binding one function to another. It is used for executing the function when a function is executed from another object.

8. How do we use AJAX in JQuery?

Answer: Ajax will be implemented differently by different browsers. This means if you are adopting the normal JavaScript way to implement the Ajax, then you will need to write the different code for various browsers to ensure that Ajax would work cross-browser.

9. What do you understand by Content Delivery Network? Mention its advantages.

Answer: Content Delivery Network (CDN) is a system of computers that are present all over the world to cache files for users to access. CDNs can immensely reduce the load time of web page by delivering files at a faster and higher bandwidth from a server that is closer to your visitor than your own server might be.

10. Explain the `empty()` method in JQuery.

Answer: The `empty()` method is responsible for removing all child nodes and content from the selected elements. However, to remove the elements without removing elements and data, we use the `detach()` method.

11. How would you use the `clone()` method in JQuery?

Answer: The `clone()` method is responsible for cloning matched DOM Elements and selects the clones. You can use this useful method for moving copies of the elements to another location in the DOM.

12. How would you use the validation JQuery plugins?

Answer: Using a JQuery plugin is a simple process. It includes:

- Include JQuery: You need to include JQuery v1.x as the validation plugin.
- Include the JQuery Validation Plugin.
- Create the HTML form.
- Create styles for the form.
- Create the validation rules.

13. Is it possible to include different versions of JQuery in a web page?

Answer: Yes, it is possible to use multiple versions of JQuery on the same page. You will need to use the `JQuery.noConflict()` method to avoid any kind of conflict. This method is useful for using multiple frameworks while using JQuery.

14. Explain caching in JQuery.

Answer: The JQuery caching is focused on the data function. Like any other JQuery functionality, data also applies to the wrapped set resulting from a query. JQuery caching is implemented as a plain dictionary in which an individual element is characterized by a value and a name.

15. Explain the `slideToggle()` method in JQuery.

Answer: The `slideToggle()` method is used for toggling between slideUp and slideDown for the selected elements. This method is useful for selecting the elements of visibility.

B.4 | Bootstrap

1. Mention the different ways of adding Bootstrap to a web project.

Answer: You can simply add Bootstrap into a web project by using the <link> and <script> tags in the header of the HTML file. We use the <link> tag for including Bootstrap style sheet in the project whereas, the <script> tag is utilized to add the JavaScript files that come along with Bootstrap.

2. Name the latest version of the bootstrap.

Answer: Currently, web developers are using Bootstrap 4.1, which is the latest stable version of Bootstrap.

3. Give one reason for choosing bootstrap over regular CSS files.

Answer: Bootstrap works as a CSS framework. With Bootstrap we can develop our websites quickly without needing to write the basic building blocks from zero all over again. This functionality saves a lot of time and lets us focus more on business logic. It also delivers inbuilt styles, standard components, and CSS classes. Bootstrap also helps in building fully responsive websites. These websites automatically adjust themselves according to the screen size to look equally good on every single device.

4. Can you create a simple button by using the classes in Bootstrap 4?

Answer: To do this we need to use the following command: `<button class="btn btn-primary">This is a Button</button>`

5. How did Bootstrap originate?

Answer: Mark Otto and Jacob Thornton at Twitter developed Bootstrap as a framework to encourage uniformity across internal tools. Originally, Bootstrap was named Twitter Blueprint and before it, different libraries were used for the development of the interface. This led to the inconsistencies and a high maintenance burden.

6. What do you understand by space utilities in Bootstrap 4?

Answer: Developers use padding spaces and margins to regulate how components and elements are spaced and sized. You will find a five-level scale for spacing utilities, based on a 1rem value default $spacer variable.

7. What is a "card" in Bootstrap?

Answer: In Bootstrap 4, a card is a bordered bot with padding near its content. This card will show you options for headers, footers, content, colors, etc.

8. What is the use of carousel in Bootstrap?

Answer: A carousel in Bootstrap gives you the functionality of slideshow to cycle through a series of content. They are built with CSS 3D transforms and some JavaScript. It could work well with multiple images, text, or your own custom mark-up.

9. What are "breadcrumbs" in Bootstrap?

Answer: Breadcrumbs in Bootstrap shows us the navigational hierarchy of a website. The separators in this hierarchy are automatically added by using CSS. We can also use breadcrumbs for the Documentation page, Magazine, and ERP system.

10. What you understand by "badges" in Bootstrap?

Answer: Badges in Bootstrap are used for adding additional information to any content. You can use the .badge class together with another contextual with elements to develop rectangular badges.

B.5 | Java

1. Differentiate between final, finally, and finalize in Java.

Answer: Final works as a modifier by which you can apply to methods, classes, variables. If you build a variable final, this means its value cannot be varied once built. Finalize is a method which is executed just before an object is a garbage collected, permitting it the last chance to save itself, but this call to finalize is not definite. Finally is a keyword that is used for exception handling, with try and catch. The finally block is always implemented regardless of whether an exclusion is thrown from try block or not.

2. Mention the list of Object class methods.

Answer: There are various object class methods:

- **`Clone():`** It creates and gives a copy of an object.
- **`Equals():`** This indicates whether an object is "equal to" this particular one.

- **`Finalize():`** This is called by the garbage collector or an object whenever the garbage collection decides that there are no more mentions to the object.
- **`getClass():`** It returns the runtime class of an object.
- **`hashCode():`** It returns a hash code value for the object.
- **`notify():`** It wakes up a single thread which is waiting on this object's monitor.
- **`notifyall():`** It wakes up all threads that are waiting on this object's monitor.
- **`toString():`** It returns a string depiction of the object.
- **`wait():`** It causes the current thread to wait until another threat summons the `notify()` method or the `notifyAll()` method for this object.

3. What are the advantages of using Java?

Answer: Java is one of the most famous programming languages in the world. It is easy to learn. Java was developed to be easy to use and thus easy to write, debug, compile, and learn the other languages for programming. Java is object oriented; this means it allows you to create reusable code and modular programs. One of the most significant advantages of Java is platform-independence. It could easily move from one computer system to another. Java's robustness, ease of use, cross-platform capabilities and its security features make it the number one choice for providing worldwide Internet solutions.

4. What is the Object and Class in Java?

Answer: Object and Class are two basic concepts commonly used in object-oriented programming (OOP). A class works as a user-defined design or concept from which objects are created. An object is a basic unit of OOP and shows the real-life entities.

5. What do you understand by JVM, JDK, and JRE?

Answer: Java virtual machine (JVM) is an abstract machine. It works as a specification to deliver a runtime environment in which Java bytecode can be executed. JRE stands for Java Runtime Environment. It is the real physical implementation of JVM. It consists set of libraries with other files that JVS uses. JDK stands for Java Development Kit. It consists of JRE and development tools.

6. Differentiate between Overloading and Overriding.

Answer: Overriding and Overloading are two important concepts in Java. They might create confusion for Java novice programmers. Overloading takes place when two or more methods in one class have the identical method name but different parameters. Whereas Overriding means having two methods having the same method name and parameters.

7. What is meant by inheritance?

Answer: Inheritance is a system in which new class is derived from an existing class. In Java, classes can inherit or gather the properties and methods of the other classes. A class that is derived from another class is called subclass. On the other hand, the class from which a subclass is derived is known as superclass.

8. What is the use of ClassLoader?

Answer: Java ClassLoaders are a very important part of Java Virtual Machine (JVM). It is used for loading a Java class into JVM.

9. What is object-oriented paradigm?

Answer: Object-oriented programming is a programming paradigm based on objects that aim to incorporate the advantages of reusability and modularity.

10. What is WORA?

Answer: WORA stands for Write Once Run Anywhere. It is a feature applicable to those programs which have the power to execute itself on a different operating system or any computer or machine.

B.6 | Spring

1. What is Spring Core?

Answer: Spring has been developed in such a way that Spring is broken down into different parts known as modules. Numerous modules are present within the Spring framework. In these, one module is known as Spring Core. It is useful for the management of the dependencies and managing complexity that is there with the components.

2. Why is Spring considered to be one of the most popular Java related frameworks?

Answer: Spring Framework provides the development of loosely coupled classes based on well-designed interfaces. This makes writing testable code easier. The Spring framework provides great integration support with other non-Spring frameworks.

3. Mention the major features in different versions of Spring.

Answer: Spring 2.5 introduced annotation-driven configuration. Spring 3.0 introduced the great of Java 5 improvements in language. Spring 4.0 is the first version to introduce Java 8 features.

4. List some of the latest specifications supported by Spring 4.0.

Answer: Spring 4.0 is very useful for supporting Java EE7 specifications. It supports JMS 2.0, JTA 1.2, JPA 2.1, Bean Validation 1.1, and JSR-236 for concurrency.

5. How is the process of validation executed by using the Spring Framework?

Answer: Spring validator can be utilized in both web and business layers to validate objects. It is based on the org. springframework.validation. We can use the following methods:

- **Supports(class):** This validator supports a specific class.
- **Validate:** This validates and sets errors into Errors objects.

6. What is the difference between @Component, @Service, @Repository and @Controller?

Answer: Typical Java backend web services or applications are based on MVC (Model, View and Controller) pattern. Hence, the application is developed in multiple layers in which Controller is the main communication point for external applications. As you know Spring is based on dependency injection and inversion of control design patterns and hence it is important for Spring to know which POJO (Plain Old Java Object) class is intended for which purpose. For this, we use annotations on the classes to identify their roles. In order for telling Spring about our Controller classes, we use @Controller annotation. Similarly, the business logic remains in the service classes which communicate with models to read and write data from the database. These classes are denoted by @Service annotation. Now, as you might have guessed, our model classes are denoted by @Repository annotation. All three annotations @Service, @Repository and @Controller are special types of @Component annotation which you have seen used for specific purposes. Hence @Component can be used for any layer.

7. What are the various types of scopes of Bean?

Answer: In Spring, <bean> definition allows to mention a scope. There are five types of scopes supported by Spring. If no scope is provided, Spring uses "singleton" as a default scope. See the following explanation of all the scopes.
Singleton: If this scope is used on the bean definition or no scope is used, Spring creates only one instance of the bean per IoC container. It means, each time we ask for a bean instance, the same instance is provided by Spring.
Prototype: If this scope is used on the bean definition, each time we ask for a bean instance, Spring creates a new instance.
Request: This scope is only for web-aware ApplicationContext. If this scope is used on the bean definition, upon each HTTP request Spring creates a new instance.
Session: This scope is only for web-aware ApplicationContext. If this scope is used on the bean definition, Spring creates a new instance on each HTTP session.
Global-Session: This scope is only for Portlet applications. Each portlet has its own session, but if you want to have a bean for all the sessions in portlets you can use Global-Session on the bean definition. In this case, Spring creates a new instance on each global HTTP session.

8. What are the benefits of using Spring Framework?

Answer: Spring is a very powerful framework. It addresses many problems faced in Java EE. This includes support for the management of business objects. It provides great programming practice like programming utilizing interfaces instead of just classes. Spring makes it possible for the developer to develop enterprise applications. It is also modular which allows you to use only those parts that are needed. Plus, it supports XML and annotation-based configuration. Lastly, Spring Test module facilitates support for the simple easy-to-test code.

9. What do you understand by ApplicationContext in Spring?

Answer: The ApplicationContext interface works as a central interface within a spring application that is utilized for delivering configuration information to the application. It is known for implementing the BeanFactory interface. Therefore, its main job is to support the development of big business applications.

10. Differentiate between Beanfactory and ApplicationContext in Spring.

Answer: There are numerous differences between BeanFactory and ApplicationContext:

- BeanFactory never provides support for the internationalization, whereas ApplicationContext can provide support for this purpose.
- Both BeanFactory and ApplicationContext has a different ability to publish an event to beans that are recorded as a listener.
- On the one hand, BeanFactory uses lazy initialization approach. On the other hand, the Application context uses eager initialization.
- BeanFactory supports Annotation-based dependency injection, whereas BeanFactory ApplicationContext supports @PreDestroy or @Autowired.

B.7 | Hibernate

1. What do you understand by Hibernate?

Answer: Hibernate is an object-relational mapping framework. It provides the developer with the capability to focus on business logic by taking care of the persistence of data by its own. A Java developer can easily write code by using an object. Then, Hibernate can do the job of creating those objects from data loaded from the database and uploading the data again to the database.

2. What is meant by ORM?

Answer: ORM stands for object-relational mapping. It works as the fundamental for Hibernate framework which is responsible for mapping database tables with Java Objects. It facilitates various API's to perform various types of operations on those data tables.

3. Mention the advantages of Hibernate over JDBC.

Answer: The greatest advantage of using Hibernate is persistence. This means the saving and loading data from Database. It also facilitates benefits to caching, lazy loading, relationship management by providing code for mapping an object into the data. This makes the developer free from writing lines of code.

4. Name the different types of caches available in Hibernate.

Answer: Hibernate delivers innovative methods of caching solutions. This includes first level caching, second level caching, and query cache.

5. Is SessionFactory thread-safe in Hibernate?

Answer: No, Session object will not be thread-safe in Hibernate. It is intended to be used within single thread in the application.

6. Differentiate between session and SessionFactory in Hibernate.

Answer: A session is a single-threaded and short-lived object, whereas SessionFactory is immutable and shared by all session. It also keeps running until the Hibernate is running.

7. What do you understand by Hibernate Query Language?

Answer: Hibernate Query Language, or HQL, works as an object-oriented extension to SQL. This makes it possible to query, store, update, and retrieve objects from a database without having the need to use SQL.

8. Differentiate between sorted and ordered collection in Hibernate.

Answer: Sorted collection collects and sorts the data in JVM's heap memory using Java's collection framework. Whereas, the ordered collection is sorted out by using order by the clause in the database itself.

9. Mention the two types of collections in hibernate.

Answer: There are two types of collection in Hibernate. First is Sorted collection and the second is Ordered collection.

10. How will you get Hibernate statistics?

Answer: You can obtain statistics by using `getStatistics()` method of SessionFactory class by this: `SessionFactory.getStatistics()`

B.8 | Model-View-Controller (MVC)

1. Mention the advantages of MVC.

Answer: MVC supports rapid and parallel development. By this, a programmer can work on the business process of the web application. You can also create multiple views of a model. It supports asynchronous technique for the developers to develop an application that loads very fast. Plus, if the developer makes a modification, then it won't affect the entire model as model parts do not depend on the views part. Lastly, MVC is also a very SEO friendly platform for generating SEO-friendly URLs.

2. Do we face ViewState in MVC?

Answer: No, MVC does not have any ViewState. It is due to the fact that ViewState is stored in a hidden field on the page.

3. What do you understand by Routing in MVC?

Answer: Routing is the method of directing an HTTP request to a controller and the utilization of this processing is implemented in System. MVC framework uses system web routing for directing a request to a controller.

4. What is meant by Output Caching in MVC?

Answer: Output Caching lets you save the response of the action method for a specific duration. This greatly assists in performance as the saved repose gets returned from the action method and does not create a new response.

5. What is a View Engine?

Answer: View Engines are very useful for creating the HTML from the views. Views consist of HTML and source code in few programming languages like C. View Engines develops HTML from the view which is then returned to the web browser and rendered. Examples of View Engines are WebForms and Razor.

6. Elaborate BundleConfig.cs in MVC4.

Answer: BundleConfig.cs in MVC is utilized for registering the bundles by the bundling process and minification system. Various bundles are added by the default jQuery libraries such as jquery.validate, Modernizr, etc.

7. Name the important namespaces used in MVC.

Answer: These are some important namespaces that are used in MVC:

- System.Web.Mvc
- System.Web.Mvc.Ajax
- System.Web.MVC.html
- System.Web.MVC.Async

8. Differentiate between ViewBag and ViewData in MVC.

Answer: ViewBag works like a wrapper that wraps around the ViewData. It makes it possible to create dynamic properties. There's no need to typecast the objects as in ViewData. However, ViewBag is slower than the ViewData.

9. What is understood by HTML helpers in MVC?

Answer: HTML helpers work like controls in the traditional web forms. However, these HTML helpers are much lighter compared to the web controls because it does not hold ViewState and the events. HTML helpers are responsible for returning the HTML string which can directly be rendered to an HTML page.

10. What is meant by "layout" in MVC?

Answer: We use layouts in MVC to get a consistent look and feel on every page of our application. It is very similar to providing master pages. However, MVC gives us more functionalities.

B.9 | REST

1. What is known as safe REST operations?

Answer: The REST API utilizes HTTP methods to execute its operations. Some of these HTTP operations which does not change the resource at the server are known as safe operations. Example: GET and HEAD.

2. Mention the advantages of using the REST template.

Answer: The REST template is very useful for the implementation of method pattern in Spring framework. It simplifies the interaction with RESTful Web Services for the client side. We can use it for consuming a RESTful Web Servicer very easily.

3. Which HTTP methods are used by REST?

Answer: These are the HTTP methods supported by REST:

- **GET:** It is used for requesting a resource at the request URL.
- **POST:** It is used for submitting information to the service for processing.
- **PUT:** By the request URL it updates the resource.
- **DELETE:** By the request URL it eliminates the resource.
- **OPTIONS:** This shows which techniques are being supported.
- **HEAD:** It shows about the request URL and it returns meta information.

4. What do you understand by RESTful web service?

Answer: The web services that are developed by using the REST style are called RESTful web services. These web services are known for using HTTP methods to adopt the concept of the REST architecture. Such web service usually defines a URI and delivers resource representation like JSON.

5. Name the protocol used by RESTful web service.

Answer: The HTTP protocol is used by the RESTful web services to make communication between the client and the server.

6. Explain payload in RESTful web service.

Answer: The request body present in every single HTTP message includes request data known as the payload. This specific part of a message is the main interesting part for the recipient.

7. Draw a comparison between SOAP and REST.

Answer: SOAP works as a protocol that makes it possible for two computers to communicate with each other by sharing XML documents. Whereas REST works a service design and architecture meant for network-based software architecture. SOAP only supports XML format, while REST can support various data formats. SOAP doesn't have caching feature, while REST can support caching. REST remains faster than SOAP.

8. Which Java API helps in the development of a RESTful web service?

Answer: There are numerous frameworks and libraries that can be used for creating RESTful web services in Java. Frameworks and libraries like JAX-RS, RESTEasy, RESTlet, and Apache CFX are some useful tools for creating RESTful web services.

9. Tells us about the resources present in a REST architecture.

Answer: The REST architecture is known for treating every single content as a resource. These identified resources can be text files, HTML pages, videos, images, or simply business data. A REST server facilitates access to resources and REST client accesses and changes these resources.

10. Elaborate on the key characteristics of REST.

Answer: REST gives us scalability, performance, simplicity, portability, and modifiability. Along with this, the REST API makes it possible for the different systems to communicate in a very simple way. Every single REST API call will have a relation between an HTTP verb and the URL. REST is a stateless but cacheable architecture that is not a protocol but a pattern.

B.10 | Web Services

1. What is understood by web services?

Answer: A web service is a software that is accessible over the Internet. It uses the XML messaging system and delivers easy to use and understand, user-interface for the end users.

2. Differentiate between SOA and a web service.

Answer: The SOA is an architecture and design meant to implement other services. It can easily be implemented by using various protocols like HTTP, HTTPS, SMTP, RMI, IIOP, etc. Whereas a web service itself is applied technology. You can implement SOA by using a web service.

3. Give an example of real web service.

Answer: The IBM web services browser is a real example of a web service.

4. Define web service protocol stack.

Answer: Web service protocol stack is a stack of various protocols that can be utilized for exploring and executing web services. The entire stack consists of four different layers: Service Transport, XML Messaging, Service Description, and Service Discovery.

5. Explain Web Services Description Language.

Answer: Web Services Description Language (WDSL) is used for describing a web service. It helps in specifying the location of the service, and the methods of the service. It is basically an XML based file which tells the client application what the web service does.

6. Mention the security measures needed for web services.

Answer: The security measures taken for web services must be more than that of what we say Secure Socket Layer (SSL). We can achieve this level of security by implementing the Entrust Secure Transaction Platform. This level of security is needed in web services for ensuring reliable transactions and safe confidential information.

7. Mention the tools used for testing a web service.

Answer: We can use SoapUI for SOAP WS and Firefox poster plugin for RESTful Services.

8. Do we need any specific application to use web service?

Answer: No, we do not have any specific application to use a web service. The name itself is self-explanatory, we can access a web service from any application that supports XML based object request and response.

9. Name some opensource and commercial implementations of web service.

Answer: Apache SOAP, REST, JAX-WS Reference implementation, Oracle Java EE Metro, Apache CXF are some examples of web services implementations.

10. Which browser allows access to web service?

Answer: JavaScript XMLHTTP Request object is important to use web service through a web browser. Internet Explorer, Safari, Chrome and Firefox support web services.

Annexure

C

Answers to Objective Type Questions

Chapter 1: Introduction to Full Stack Development

1. (a) `getCurrentPosition ()`
2. (d) `window.captureEvents (Event.CLICK);`
3. (d) Default Status
4. (b) Semicolon, colon
5. (a) True

Chapter 2: Getting Started with Full Stack Development: A Project Idea

1. (d) Multi-value attributes
2. (c) Flowchart
3. (d) None of the above
4. (a) Spot potential problems
5. (d) Dotted Oval

Chapter 3: Introduction to Hyper Text Markup Language

1. (a) True
2. (d) <summary>
3. (b) Canvas
4. (d) crossOrigin
5. (d) All of the above

Chapter 4: Introduction to Cascading Style Sheets

1. (a) text-align
2. (a) Accelerator
3. (d) All of the above
4. (a) Selector
5. (d) CurrentColor Keyword

Chapter 5: Introduction to jQuery

1. (c) `preventDefault()`
2. (a) True
3. (a) `Sort()`
4. (b) `empty()`
5. (b) `filter (selector)`

Chapter 6: Introduction to Bootstrap

1. (b) 1.428
2. (b) Providing different icons
3. (b) Fluid layout
4. (c) .img-thumbnail
5. (d) modal

Chapter 7: Build Pages for MyEShop with HTML and CSS

1. (b) <p>
2. (a) How to display the page.
3. (c) CGI-BIN
4. (d) border-bottom-left-radius
5. (b) border-collapse

Chapter 8: Use of jQuery on HTML CSS

1. (a) `.toggle()`
2. (b) `data()`
3. (b) False
4. (b) `hide()`
5. (b) JavaScript

Chapter 9: Use of Bootstrap to Make HTML Responsive

1. (a) 12
2. (b) Carousel
3. (c) 20px
4. (a) list-group
5. (c) .danger

Chapter 10: Introduction to Java Language

1. (d) Javac
2. (d) Java
3. (a) Javadoc
4. (a) Java Archive
5. (d) Finalize

Chapter 11: Language Syntax and Elements of Language

1. (c) 64
2. (d) /*
3. (b) char
4. (a) True
5. (b) '23'

Chapter 12: Object-Oriented Programming

1. (d) Explicit
2. (a) Multitasking
3. (b) Initializing a newly created object
4. (a) Overriding
5. (a) Object-Oriented Programming System

Chapter 13: Generics and Collections

1. (d) Generics are useful for adding stability to the code by making bugs detectable at compile time.
2. (b) N
3. (b) Type Interface
4. (b) Java.util
5. (c) A group of objects

Chapter 14: Error Handling

1. (b) Run time
2. (b) thrown
3. (b) throw
4. (c) Throwable
5. (d) None of the above

Chapter 15: Garbage Collection

1. (b) `finalize()`
2. (b) JVM
3. (b) Young Space
4. (d) Mark and sweep model
5. (b) JVM

Chapter 16: Strings, I/O Operations, and File Management

1. (b) String class is defined in java.util package.
2. (d) `equals()`
3. (b) FileReader
4. (a) `read()`
5. (b) `write()`

Chapter 17: Data Structure and Integration in Program

1. (a) Linear Data Structure
2. (b) Unsigned
3. (a) Two
4. (a) True
5. (c) Expression Tree

Chapter 18: Lambdas and Functional Programming

1. (b) False
2. (a) Predicate
3. (a) True
4. (b) `LocalTime.now();`
5. (a) Yes

Chapter 19: Multithreading and Reactive Programming

1. (c) Process and thread based
2. (b) Integer
3. (d) `start()`
4. (b) 5
5. (b) False

Chapter 20: Introduction to Spring and Spring MVC

1. (a) DispatcherServlet
2. (d) RequestMapping
3. (c) Validator
4. (a) Yes
5. (b) HandlerAdapter

Chapter 21: Introduction to Hibernate

1. (b) SessionFactory
2. (d) Dselect fetching
3. (c) Query By Criteria
4. (c) .hbm
5. (c) Third Level

Chapter 22: Develop Web Services for the APIs

1. (c) @Autowired
2. (a) Model View Controller
3. (b) Container for classes
4. (a) Provide access to an underlying database

Chapter 23: Develop Models with Hibernate

1. (a) Relational Database Management System
2. (c) CascadeType.SAVE
3. (b) False
4. (a) True
5. (a) @GeneratedValue